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ABSTRACT

This paper describes a multimedia workshop at Worcester State College (Massachusetts) organized by computer science students to give their older classmates the opportunity to gain "hands on" experience with multimedia computers. A questionnaire on the effectiveness of multimedia systems was completed by 35 older students, whose average age was 70. Five tables depict responses to survey items for: attitudes toward multimedia; physical and cognitive issues; workshop organization; future use of multimedia technology; and self-reported experience level. Overall, the older students who participated in the workshop had positive experiences with the technology. (Contains 23 references.) (AEF)

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Paper (W1-201B)

Introducing Elderly College Students to Multimedia: An Intergenerational Approach

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Abstract

This paper describes a multimedia workshop organized by younger computer science students for 35 of their older classmates, average age 70. Results of a follow-up survey indicate that elders' responses to multimedia are positive, although older students still feel unsure about their technical abilities and may need continuing help to take full advantage of the new technology.

Introduction

The computer revolution is being coupled with yet another unprecedented trend—the aging of the American population. By the year 2000, it is expected that 13 percent of the population will be aged 65 and older. Senior citizens will comprise more than 1/5 of the population by the year 2030, when the baby boom generation reaches old age (United States Census Bureau, 1989).

This "Age Wave" is expected to impact higher education, as an increasing number of older adults return to college seeking lifelong learning experiences (Dychtwald and Flower, 1989). For example, over half of the part-time student population, which now comprises 41 percent of all undergraduates, falls outside of the traditional 18 to 24-year-old age group, with a full five percent reported as being over the age of 50 (Dembner, 1993a). Worcester State College, which enrolls over 100 elderly students each semester, has promoted intergenerational education for the past ten years and is cited as a model for this approach (Power, 1988; Stepakoff, 1993; Dembner, 1993b).

The "elder program" at Worcester State is, quite simply, the college. Older and younger students learn together in the classroom, discuss politics in the hallways, socialize over lunch, and hustle for parking spaces. Over 300 elders have taken computer courses ranging from word processing to programming to database design, and have participated in research projects involving innovative computer technology such as speech recognition and natural language interfaces (Ogozalek, Power, Hebhardt, & Perrolle, 1992).

Multimedia Technology and the Older Learner

Existing research suggests that elders are capable and enthusiastic computer users (Ogozalek, 1991). For example, Furlong and Kearsley (1990) designed a highly successful programming course for seniors and established "SeniorNet," a nationwide network for older computer users (Furlong, 1988). Other experimental studies have shown that elders can successfully use computers for tasks ranging from word processing and electronic mail to information retrieval and computer-assisted decision making (Charness, Schumann, and Boritz, 1992; Johnson, 1990; Czaja et al., 1989; Hahm and Bikson, 1989; Ogozalek and VanPraag, 1986). Surveys conducted by the AARP (Edwards and Englehardt, 1989) and the Aspen Institute (Tingay, 1988) indicate that elderly people have generally positive attitudes toward technology and want to learn to use computers .

Research involving younger adult users has shown that interactive multimedia improves information retention; people retain 10 percent of what they see, 20 percent of what they hear, 50 percent of what they see and hear, and 80 percent of what they see, hear, and do (Fletcher, 1990). Since research shows that the amount of time spent reading decreases with age, due to vision problems associated with aging (McEvoy and Vincent, 1980), a multimedia interface may lighten the load on

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older students' diminishing sensory abilities. A recent study in which older adults seeking medical information preferred a multimedia computer to either a printed leaflet or text-only computer interface supports this idea (Ogozalek, 1992).

The Intergenerational experience at Worcester State College supports earlier findings that the graying of the college classroom enhances learning for all age groups, because of heightened levels of discussion, questioning, and, in general, a more interactive learning environment (Kay and Jensen-Osinski, 1983). Students majoring in computer science at the college have become highly sensitized to the special needs of the aging population. For example, in the computer laboratory, younger students have noticed that many of their older classmates have difficulty reading the CRT screen, especially when a small font is used.

Given the recent wave of advances in multimedia technology, computer science students were interested in seeing if this new type of computer interface could perhaps reduce some of these age-based differentials. To do this, they organized an afternoon workshop to give older students the opportunity to gain some "hands on" experience with multimedia computers. To gather data about the effectiveness of multimedia systmes, they also designed a questionnaire for the participants to complete.

The Workshop

There were 35 "official" participants who completed the survey, although nearly 100 older students stopped by to try out the computer systems. The mean age of elderly participants who completed the survey was 70 years. Sixty-three percent of the responding participants were women (mean age 69.6 years), while only 37 percent were men (mean age 70.5 years). Thirty-four percent described themselves as having "no computer experience," 34 percent as having "minimal experience (ATM, VCR, etc.)," and 32 percent reported experience with programming, wordprocessing and spreadsheets.

Twenty-five computers comprised the "Building Blocks" exhibit, which was based on the premise that participants would have a better understanding of multimedia systems if they could see the various ingredients that went into them. For example, one computer was hooked up to a camcorder which was aimed at a high traffic area; peoples' images were captured on the CRT and displayed with digitized effects. A music program allowed participants to use the computer keyboard to compose simple songs. A graphics display prompted the user for numeric input, which was then transformed into hypnotically undulating fractal images.

Two multimedia systems which fully utilized sound, graphics, and full-motion video were, by far, the most popular workstations. The Visualized USP DI, a prototype version of the United States Pharmacopeia Drug Information for the Consumer, provides visual and audio information about a drug's brand and generic names, how the drug works, which other drugs which may cause interactions, and so on. For example, rather than simply reading about the side effect of "blurred and double vision," the user sees a blurry video clip of medicines on a shelf, presumably what one would see if one were experiencing the side effect. The Name Game, created by Mindbank, is designed to improve the user's memory in a role-playing game in which the user acts as a spy. For example, the user engages in simulated conversations that take place at a imaginary party, and then, afterwards, is asked to recall the names of the various guests encountered. Helpful techniques for remembering names and faces are offered along the way.

Elders were very excited about the potential for multimedia systems, especially if they could have access to such systems at home in the way that they now watch TV. "You could press a button to ask for an antidote for swallowing poison," suggested one 81-year-old man, "and get an immediate response. If you give information about how to deal with emergencies at home, it will help the elderly to remember the necessary information."

In addition, a classroom adjacent to the computer laboratory was set up as a lecture area, where participants could watch a videotaped demonstration of the Ulysses program, a multimedia course on Tennyson's poem created by Hollywood film maker Robert Abel for IBM. The Ulysses program uses a hypertext approach which allows users to access a variety of video and film clips to enhance understanding of the poem. For example, students may choose from several different oral interpretations in which actors read the poem aloud or they may view an MTV-type montage comparing Ulysses to more contemporary heroes ranging from Martin Luther King Jr. to the Chinese man who faced down the tanks near Tiananmen Square in 1989 (Rogers, 1992).

The older students appeared to be captivated by the Ulysses program and many viewed the tape two or three times. "What a fantastic way to teach literature!" exclaimed one 75-year-old woman. "I remember reading Ulysses in high school; it was torture." The elders particularly liked one feature of the program, which provided descriptions of other forms of verse: villanelle, haiku, and even a video interview with a modern-day rapper who explains that he creates his form of poetry out of the same desire for self-expression as Tennyson. "I've been wondering what rap music is," remarked a 76-year-old man, "and I never expected it would have anything to do with a poem I learned back in high school."

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Survey Results

The computer science students designed a written survey for the participants which consisted of thirty 5-point Likert scale items, as well as several open-ended questions about their workshop experience.

Attitudes toward Multimedia. Responses to the multimedia systems were overwhelmingly positive, as shown in Table 1. (Notice that the column for the "disagree" response has been omitted; there were no negative responses.)

Attitudes Toward Multimedia		
Statement	Agree	Neutral or No Response
• I think that multimedia technology can appeal even to those people with no previous computer experience.	89%	11%
• Multimedia technology can be used to help motivate students at all levels in the education system.	86%	14%
• The combination of graphics, still photos, motion video, and audio narration in these computer systems is a powerful communication method.	83%	17%
• Sound and graphics greatly enhance any computer software.	74%	26%

Table 1. Responses to survey items for attitudes toward multimedia (N = 35; mean age = 70.0 years)

Some of the written reactions include: "A great future in every field—it's in its infancy" (male, age 62); "one in every home someday" (female, age 64), and "a way of life" (female, age 75).

Physical and Cognitive Issues. Elders may experience physical and cognitive changes associated with aging—vision and hearing loss, decrease in manual dexterity, problems with short term memory and so on—which may make computers less accessible. The majority of elderly participants in this workshop, however, had no problems seeing or hearing the displays, as shown in table 2.

Physical and Cognitive Issues			
Statement	Agree	Disagree	Neutral or No Response
• I found the computer screens difficult to read.	6%	63%	31%
• The print sizes in these computers were too small.	11%	66%	23%
• The audio portions of these systems were difficult to hear.	23%	54%	23%
• It was difficult to select options from the computer menus.	17%	46%	37%
• The computer systems went too fast for me.	23%	40%	37%
• I prefer the touchscreen to the keyboard.	63%	0%	37%

Table 2. Responses to survey items for physical and cognitive issues (N = 35; Mean age = 70.0 years)

The low percentage of visual difficulties reported may be due to the fact that, whenever possible, the computer science students modified text to be displayed in larger-than-normal fonts. The lack of audio difficulties was much more surprising, given the background noise level of conversations and others computers; the combination of sound with graphic and video cues may have compensated for the noisy surroundings.

The Workshop Approach. As shown in Table 3, the workshop approach was a successful way to introduce older students to new technology. Many of the elders expressed relief that their first encounter with a computer was in a relaxed

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environment with student aides available to help with problems. This is consistent with Eilers' (1989) observation that a supportive environment is important for elder users.

Workshop Organization			
Statement	Agree	Disagree	Neutral or No Response
• I found it easy to meet and talk with new people at this gathering.	86%	0%	14%
• This event should be held again in later years.	83%	0%	17%
• I found the exhibits educational and intriguing.	83%	3%	14%
• These computer systems were pleasant to use.	69%	11%	20%
• It was easy to understand the language and images used by the multimedia demonstrations.	57%	11%	32%

Table 3. Responses to survey items about workshop organization (N = 35; mean age = 70.0 years)

Did the Workshop Stimulate Further Interest in Multimedia Technology? The majority of participants went away from the workshop feeling that computer and multimedia technology can play a vital role in their educational experience, as shown in Table 4.

Future Use of Multimedia Technology			
Statement	Agree	Disagree	Neutral or No Response
• Senior citizens can become as proficient with computers as the younger generation of computer users.	89%	3%	8%
• I would be interested in taking classes related to today's presentation.	66%	9%	25%
• If given the opportunity, I would like to learn how to program a computer.	57%	11%	32%

Table 4. Responses to survey items for future use of multimedia (N = 35; mean age = 70.0 years)

Sentiments more commonly associated with younger users were expressed: "The biggest problem with the computers," explained a 71-year old woman, "was that I didn't have enough time to try as many as I could." A man, 81, complained, "There were too many people; I'd like more time, without anybody on my back waiting to use the computer."

If there is any barrier that older students will face when it comes to using educational technology, it is their own lack of self-confidence when it comes to seeing themselves as capable computer users. In our statistical analysis of the survey data, the only significant interaction we found was between self-reported experience level and the statement "I would consider myself an experienced computer user," as shown in table 5.

I consider myself an "experienced computer user."					
Level of Experience	Agree	Neutral	Disagree	No Answer	Total
None	0	0	11	1	12
Minimal	0	3	9	0	12

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Experienced	1	6	3	1	11
Total	1	9	23	2	35

$x2 = 13.74, p < .033$

Table 5. Response to survey item I consider myself an "experienced computer user." (N= 35; mean age = 70.0 years)

A typical case is that of a 73-year old woman with extensive spreadsheeting and programming experience who nevertheless reported that her biggest problem of the day was her "knowledge of computers—I don't feel well-informed enough."

Most of these apprehensions were alleviated by the presence of more experienced users who were willing to help out. As one 84-year-old participant explained, "It was my first attempt to operate a computer; however, with proper explanation, I was able to adapt to the system." This supports the finding by Zandri and Charness (1989) that elders can reach performance levels equal to younger users, but that they will probably need more help and time to complete tasks.

Discussions and Conclusions

By creating situations in which educational technology can be encountered in an intergenerational atmosphere, both older and younger college students can benefit. In addition to the workshop approach described here, a variety of other intergenerational activities can be explored. At Worcester State, for example, the success of the workshop stimulated another group of computer science students to organize a Computer-Human Interaction seminar in which the main activity was the design and implementation of a simple controlled experiment involving input devices for elderly computer users. Recently, a partnership with a local elementary school broadened the intergenerational computer program to include the other end of the age spectrum when some elderly computer science students ran a programming class for sixth-graders.

The growing number of older students in the college population may be viewed as an asset or a liability, as an institutional problem or an educational resource. When elders encounter unfamiliar technology in the classroom, the situation can be seen as an obstacle or as an opportunity to devise new ways to increase understanding. At Worcester State College, we have found that taking the latter approach improves the educational experience for all students, young and old alike. We hope that by sharing our experience we will encourage similar intergenerational encounters with technology in all types of educational settings.

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